



Genes involved in isoprenoid compound production

Description of Technology: This invention is in the field of microbiology. More specifically, this invention pertains to nucleic acid fragments encoding enzymes useful for microbial production of isoprenoid compounds.

Patent Listing:

1. **US Patent No. 6,660,507**, Issued December 9, 2003, "Genes involved in isoprenoid compound production"

<http://patft.uspto.gov/netacgi/nph-Parser?Sect2=PTO1&Sect2=HITOFF&p=1&u=%2Fnetacgi%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&d=PALL&RefSrch=yes&Query=PN%2F6660507>

Market Potential: Isoprenoids are an extremely large and diverse group of natural products that have a common biosynthetic origin, i.e., a single metabolic precursor, isopentenyl diphosphate (IPP). The group of natural products known as isoprenoids includes all substances that are derived biosynthetically from the 5-carbon compound isopentenyl diphosphate. Isoprenoid compounds are also referred to as "terpenes" or "terpenoids", which is the term used in the designation of the various classes of these examples (Spurgeon and Porter, Biosynthesis of Isoprenoid Compounds, pp 3-46, A Wiley-Interscience Publication (1981)).

Isoprenoids are ubiquitous compounds found in all living organisms. Some of the well-known examples of isoprenoids are steroids (triterpenes), carotenoids (tetraterpenes), and squalene, just to name a few.

Although most of the genes involved in the isoprenoid pathways are known, the genes involved in the isoprenoid pathway of methanotrophic bacteria are not described in the existing literature. However, there are many pigmented methylotrophic and methanotrophic bacteria, which suggests that the ability to produce carotenoid pigments is widespread in these bacteria and therefore the genes must be widespread in these bacteria. Applicants have isolated a number of unique open reading frames encoding enzymes of the isoprenoid biosynthesis pathway from a *Methylobacter* sp.

Applicants have solved the stated problem by isolating genes containing 9 open reading frames (ORFs) encoding enzymes involved in isoprenoid synthesis.

Benefits:

- New gene sequences suitable for isoprenoid compound production

Applications:

- Microbiology

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